

ASSESSMENT OF BACK PAIN (PART 4)

LABORATORY INVESTIGATIONS

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Abstract: Chiropractors and Osteopaths are routinely involved in the assessment and treatment of patients with back pain. An overview of pertinent laboratory studies is presented to facilitate a better understanding of the use and value of these procedures toward improved patient management and enhanced communication with other health care professionals, in particular medical practitioners, as some patients may benefit from a combined management approach.

Key Words: Back pain, laboratory investigations, chiropractic, osteopathy.

INTRODUCTION

The first step in the management of a patient presenting to a chiropractor or osteopath with back pain is to differentiate those patients with 'mechanical' back pain from those with overt disease.

In addition to history (1), clinical examination (2) and imaging procedures (3), there are a variety of simple blood and urine tests which may detect pathology. This paper presents a description of the use of the tests most commonly used in hospitals and private practice together with some of the more specific investigations. The information provided has been drawn from two well known texts.(4)(5)

FULL BLOOD EXAMINATION (FBE, CBC)

The Full Blood Examination together with urea and electrolytes would be the most common blood tests ordered. Analysis is made of the number and morphology of the formed blood elements. Information is provided about the general condition of the patient together with more specific diagnostic indicators for a variety of haematological and haematopoietic diseases which may affect the marrow cavity of the vertebral bodies. White cell indicators may provide information leading to the diagnosis of infection such as osteomyelitis affecting the spine.

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UREA and ELECTROLYTES (U & E) (Ca PO4)

This very commonly ordered blood test provides information about the plasma levels of various salts and compounds. This assessment of the general biochemical status of the patient may be changed in a host of metabolic disorders. The electrolytes most significant in the diagnosis of metabolic bone disease causing back pain are calcium and phosphate and these assays must be ordered in addition to the standard electrolytes. Urea and creatinine are elevated in a variety of disorders which lead to renal failure and may cause flank pain.

ERYTHROCYTE SEDIMENTATION RATE (ESR)

This is a measure of the distance in millimetres from the surface meniscus to the upper limit of a red cell column in a sample of blood that has been left standing for 60 minutes. The rate of sedimentation depends on the specific gravity of the red cells compared to the plasma as well as the presence of clumping or rouleaux formation of the red cells. The ESR is a non-specific indicator of organic disease. It is elevated in acute and chronic infections, neoplasia, collagen disease, renal insufficiency and any disorder associated with a significant change in plasma proteins.

C- REACTIVE PROTEIN (CRP)

This protein is synthesised in the liver and is secreted in increased amounts within six hours of an acute stimulus. The stimulus required includes most forms of pathology and so the CRP also is a non-specific indicator of disease. It rises more rapidly than ESR, peaks at fifty hours, then falls rapidly upon cessation of the stimulus. The ESR, however, is more useful in the detection of multiple myeloma as paraproteins do not necessarily provoke an acute phase response from the liver.

ALKALINE PHOSPHATASE (ALK PHOS)

Produced by osteoblasts, an elevated level of alkaline phosphatase is associated with bone forming activity and may reflect normal growth in the young, fracture healing and increased bone turnover in metabolic and metastatic disease. Even in a purely destructive process such as an osteolytic tumour deposit, the body's reaction to heal the destroyed bone will lead to elevated levels of alkaline phosphatase.

RHEUMATOID FACTOR (Rf)

Rheumatoid factors are IgM class antibodies directed against the Fc portion of altered gamma globulin. Eighty percent of people with classical rheumatoid arthritis have a positive Rf test. Rheumatoid factor may be present in other connective tissue disorders as well as other immune disorders and chronic infections.

HLA B27

The HLA locus is on chromosome 6. It codes for antigens that are cell surface glycoproteins that are present as nucleated cells. They are cell markers for the identity and recognition of self as opposed to foreign cells. The B27 site on the HLA locus is present in 90% of people with Ankylosing Spondylitis but is present in 10% of people without this disorder. The utility of HLA B27 in the diagnosis of Ankylosing Spondylitis is limited.

PROSTATIC ACID PHOSPHATASE (P.A.P.)

Prostatic acid phosphatase which is produced by malignant prostate cells will be elevated in 90% of patients with metastatic disease and 45% of patients with disease confined to the prostate. It is not elevated in patients with benign prostatic hypertrophy.

PROSTATE SPECIFIC ANTIGEN (PSA)

This antigen may be produced by both malignant and normal prostate cells. Very high levels are suggestive of cancer but elevated levels are seen in benign prostatic hypertrophy. The main use of this test is in following progression or regression of patients under treatment of established malignant disease.

MID STREAM URINE (MSU) / URINALYSIS

Simple dip stick tests can be performed in the clinic. A variety of assays on a semi-quantitative basis can be achieved. Information regarding the presence of protein and nitrates may lead to a suspicion of infection in the renal tract and blood may represent obstruction due to calculi. These inexpensive dip stick procedures are a screening test only.

Most chiropractors and osteopaths rarely use laboratory diagnosis themselves but a general knowledge of their diagnostic applicability will lead to improved patient management and enhanced interprofessional dialogue.

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